

# Factors Associated with Breastfeeding Initiation in Adolescent Pregnancies: A Cohort Study



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## ABSTRACT

**Purpose:** Adolescent mothers have a lower breastfeeding rate than adult women. The objective is to determine the association between multiple high-risk characteristics of pregnant adolescents with intention and initiation of breastfeeding.

**Methods:** We conducted a retrospective population-based cohort study in Ontario (2006–2012) using the Better Outcomes Registry & Network (BORN) database. Breastfeeding outcomes of adolescent women (younger than 20 years) with a singleton live-born infant at term gestation (37 weeks or greater) were analyzed. The  $\chi^2$  and independent-sample *t* tests were used where appropriate. A multivariate logistic regression analysis was also performed.

**Results:** This study included 22,023 adolescent women with complete breastfeeding information. Almost half (48.8%, *n* = 10,749) exclusively breastfed their infant at time of hospital discharge. Breastfeeding was significantly more likely in the older adolescents (odds ratio 1.10); other factors significantly associated with breastfeeding included intention to breastfeed, prenatal classes attendance, living in a higher-income neighborhood, having a spontaneous vaginal delivery, being a nonsmoker, not using substances during pregnancy, and not having any preexisting health problems or obstetrical complications (*P* < .0001). A significant interaction between smoking and intention to breastfeed was identified. Intention to breastfeed was found to be protective against the reduction in breastfeeding seen with smoking.

**Conclusion:** This large-cohort study confirms that high-risk factors are associated with lower breastfeeding in Canadian adolescent term singleton births. Breastfeeding intention is a very important driver of breastfeeding. These findings highlight the importance of early multidisciplinary adolescent pregnancy care targeting these risks factors and education in order to improve breastfeeding rates in this population.

**Key Words:** Adolescent pregnancy, Breastfeeding intention, Breastfeeding initiation, Sociodemographic, Risk factors, Ontario Canada

## Introduction

Breastfeeding provides multiple health benefits to infants, including improved immunity and digestion, brain development, and general growth.<sup>1–3</sup> Research also suggests that breastfeeding has a protective effect against obesity later in life.<sup>1,3</sup> The benefits extend to mothers as well. The risk of postpartum hemorrhage may be reduced by breastfeeding immediately after delivery,<sup>1</sup> and there is increasing evidence that the risk of breast and ovarian cancer as well as type 2 diabetes is lower among women who breastfeed.<sup>1–3</sup> Furthermore, weight loss is more rapid after birth, and there may be a delayed return of menses, which would thus delay the return of fertility.<sup>1,3</sup> Breastfeeding also fosters a bond between mothers and infants, suggested to contribute to a healthy psychological development of the newborn.<sup>1–3</sup> Mothers who choose to breastfeed display more sensitivity toward their infants, which supports a healthy attachment type with their infants.<sup>4</sup>

The World Health Organization (WHO) and UNICEF's global recommendations for optimal infant feeding is exclusive breastfeeding during the first six months of life.<sup>1</sup> In Canada, a joint statement by Health Canada, Canadian Paediatric Society, Dieticians of Canada, and Breastfeeding Committee for Canada states that exclusive breastfeeding for the first months is important for the nutrition, immunologic protection, growth, and development of infants and toddlers.<sup>2,3</sup>

Breastfeeding initiation rates among Canadian women have increased significantly in the past decades. In 1965, less than 25% of mothers breastfed compared with 88.4% in 2011.<sup>2,3</sup> However, only 27.8% of the women who initiated breastfeeding in 2011 continued to breastfeed their infants to 6 months.<sup>2,3</sup> Adolescent mothers have an even lower initiation and continuation rate of breastfeeding than do adult women.<sup>5–8</sup> Published data for breastfeeding rates among adolescent mothers are sparse.<sup>5</sup> One American study indicated that 42.8% of adolescent women initiated breastfeeding, while only 9.1% continued to breastfeed to 6 months, compared with 15% to 34% of mothers from all other age groups.<sup>5</sup> While a Canadian cohort found that breastfeeding intention rate in adolescent mothers was 83.1%, the actual breastfeeding rate at hospital discharge was 45.6%.<sup>9</sup> Compared with adults, Ontario adolescents

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have a 27% lower rate of exclusive breastfeeding at hospital discharge (adjusted relative risk [aRR] 0.73 95% CI 0.71–0.76).<sup>10,13</sup>

Adolescent mothers and their infants are at greater risk for of many health and socioeconomic issues. Young mothers have a tendency to have anemia, hypertension, and depressive disorders.<sup>2,11,12</sup> Their infants are more likely to have low birth weight, be born preterm, and have developmental and learning difficulties.<sup>2,12</sup> Finally, teen pregnancy can be a significant predictor of other social, educational, and employment barriers later in life.<sup>2</sup>

Studies in the adolescent population suggest that multiple sociodemographic factors are associated with lower rates of breastfeeding. These include age, race, educational level, and marital and socioeconomic status.<sup>5,6,8</sup> Other studies suggest a lack of knowledge, a negative opinion about pregnancy, as well as a lack of support for breastfeeding from family, friends, and the partner affect breastfeeding rates.<sup>5,6</sup> However, these studies have been conducted outside of Canada (United States and the United Kingdom) and, therefore, results might not be applicable to the adolescent population in Ontario or Canada. The objective of this cohort study is to characterize the association between multiple sociodemographic characteristics of pregnant adolescents in Ontario with breastfeeding intention and initiation.

## Methods

We conducted a retrospective population-based cohort study in Ontario, Canada, with the information collected by the Better Outcomes Registry & Network (BORN) database. The BORN Information System (BIS) collects a summary of pregnancy, birth, and early newborn care for all women giving birth across the province, including maternal and newborn sociodemographic information.<sup>13</sup> Demographic and clinical information are collected from charts, clinical forms, and patient interviews during admission for delivery. Data capture across the fiscal years varied between 98.3% of hospital births in 2009–2010 to 100% of hospital births in 2010–2011.<sup>13</sup>

In this study, we analyzed breastfeeding outcomes of adolescent women (younger than 20 years) who gave birth in an Ontario hospital and who delivered a singleton live-born infant at term gestation (37 weeks' or greater gestation) by using a 5-year dataset (April 1, 2006, to March 31, 2012) involving more than 20,000 adolescents. Multiple gestation and preterm infants were excluded as these babies often require intensive care and may have valid reasons for formula supplementation. Home births, which represent approximately 2% of the total number of births in Ontario, were also excluded.

The outcome measure was whether the mother was exclusively breastfeeding her infant at time of discharge from the hospital. Other information extracted from the BIS included maternal demographic information (age at time of birth), health and obstetrical characteristics (maternal health problems, parity, delivery type, and obstetrical complications), and prenatal health behaviors (smoking, alcohol dependence and substance use during pregnancy,

attending prenatal classes, and being under the care of an antenatal health care provider). Maternal age and parity were analyzed as continuous variables. Delivery type was coded for spontaneous vaginal birth, assisted vaginal birth, and cesarean section. The remaining variables were dichotomous variables to indicate presence and absence of a behavior or characteristic.

Maternal health problems included asthma, hypertension, diabetes, heart disease, hepatitis B, HIV, lupus, psychiatric disorders, and thyroid disease. Obstetrical complications included eclampsia, gestational diabetes, hypertension (gestational or transient), intrauterine growth restriction/small-for-gestational-age, large-for-gestational-age, periodontal infection, placenta previa, placental abruption, preeclampsia, premature rupture of membranes, preterm labor, preterm premature rupture of membranes, urinary tract infection, and other cervical/vaginal infections.

To obtain sociodemographic information, we used the Postal Code Conversion File (PCCF+) provided by Statistics Canada to link the birth records with information from the 2006 long-form Canadian census via maternal postal codes. Each record was assigned to a dissemination area to extract neighborhood-level information on the highest level of completed education and median family income. Both sociodemographic variables were presented in quartiles with each quartile containing approximately one-fourth of the population of Ontario and but not necessarily one-fourth of the mothers in our study population.

To determine which independent variables correlate with breastfeeding at discharge,  $\chi^2$  and independent-sample *t* tests for categorical and continuous variables were used, respectively. We then ran a multivariate logistic regression using forward stepwise selection procedure to determine the final model that best predicts breastfeeding behavior in adolescent mothers. The criterion for entering a variable in the model was set at  $P < .05$ . All variables that were significantly associated with breastfeeding at discharge and, all corresponding 2-way interactions were included in the final model. Subjects would only be included in the analysis if they were not missing values on any of the variables that were included in the final model. All analyses were conducted using SAS Enterprise 4.3 software. This study received ethics approval from both the Children's Hospital of Eastern Ontario and the Ottawa Hospital research ethics boards (#13/19X and #20120915-01H, respectively).

## Results

There were 26,072 records that met the inclusion criteria for the study; however, 4,049 records were missing information on breastfeeding at discharge and were excluded from the analysis. Of the remaining 22,023 women without missing information on breastfeeding at discharge, there was a total of 48.8% (10,749) who exclusively breastfed their infant at the time of discharge from hospital.

Table 1 displays the demographic characteristics of the study population. Close to 70% (69.9%) of adolescents were aged 18 to 19 years, while 29.2% were aged 15 to 17 and only 0.9% were aged 14 years or less. Health care delivery in Ontario is divided into 14 regions, or Local Health

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